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ABSTRACT

The appropriate-for-gestational-age (AGA) and small-for-gestational-age (SGA) infants from 30 pairs of full-term and 15 pairs of preterm same-sex twins were compared for neonatal temperament. The evaluation of neonatal temperament included ratings of irritability, resistance to soothing, activity level, reactivity, and reinforcement value. Results of t-tests indicated that for both the full-term and preterm groups, there were no significant differences between AGA and SGA infants in any of the behavioral areas. A stepwise discriminant analysis failed to demonstrate differences in the neonatal temperament profile of AGA and SGA infants. It was concluded that being small for gestational age does not place the infant at risk for deviance in behaviors related to temperament during the neonatal period. (Author/RH)

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Size for Gestational Age and Neonatal Temperament

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ABSTRACT

Neonatal temperament was compared between appropriate-for-gestational-age (AGA) and small-for-gestational-age (SGA) infants from 30 pairs of full-term and 15 pairs of preterm same-sex twins. The evaluation of neonatal temperament included ratings of irritability, resistance to soothing, activity level, reactivity, and reinforcement value. The results of *t* tests indicated that, for both the full-term and preterm groups, there were no significant differences between AGA and SGA infants in any of the behavioral areas. A stepwise discriminant analysis failed to demonstrate differences in the neonatal temperament profile of AGA and SGA infants. It was concluded that being small for gestational age does not place the infant at risk for deviance in behaviors related to temperament during the neonatal period.

INTRODUCTION

The association between size for gestational age and development has been examined to determine if intrauterine growth retardation affects various areas of development. When compared with appropriate-for-gestational-age (AGA) children, small-for-gestational-age (SGA) children have been described as likely to have learning difficulties at school, a higher incidence of neurological and behavioral abnormalities, and poor scores on developmental tests. Several studies have suggested, however, that SGA infants are not necessarily developmentally delayed.

Previous research has focused on the developmental integrity of the infant. Recently temperament has received much attention since problems in this area can lead to later behavioral problems. Some aspects of temperament are apparent during the neonatal period and have been related to behavior in later infancy. It is of interest, therefore, to compare neonatal temperament in AGA and SGA infants to determine if this is an additional area of risk for the SGA infant. It also has been well-documented that preterm infants are at risk for various developmental disabilities, and it is of interest to determine if being both preterm and SGA increases the likelihood of deviance in the area of temperament.

METHOD

Subjects. The sample consisted of 30 pairs of same-sex, full-term twins (18 female, 12 male) born between 38 and 41 weeks gestational age, and 15 pairs of same-sex, preterm twins (8 female, 7 male) born between 31 and 37 weeks gestational age (mean = 34 weeks).

Procedure. Full-term AGA infants were assessed between 1 and 7 days of age (mean = 3.8); full-term SGA infants were assessed between 1 and 19 days of age (mean = 4.5). Preterm infants were examined when they were medically stable, just before discharge from the hospital, as follows: preterm AGA infants were assessed between 5 and 63 days (mean = 20.0); preterm SGA infants were assessed between 5 and 105 days (mean = 24.8). There were no significant differences in test chronological age between AGA and SGA infants for either the full-term or preterm groups.

Neonates were assessed from one feeding period to the next (three to four hours) so that behavior could be evaluated throughout a metabolic cycle, and the neonate's responsivity could be observed during several behavioral states.

1. Each neonate was fed at its regularly scheduled feeding time. Behavioral ratings included evaluations of the infant's behavioral state, irritability, and activity during and around the feeding time, and of the infant's feeding adequacy (i.e., rooting, sucking, spitting, etc.).

2. For a 10 minute period during the first active sleep state, 15-second time sampling recordings were made of spontaneous activity consisting of the number and vigor of limb movements to obtain an index of activity during sleep.

3. Midway between feedings the infant was awakened so that maturational level, sensorimotor status, and orienting behaviors could be assessed. Measures included visual or auditory orienting responses toward a bulls-eye, rattle, bell, voice, face and voice combined; reflexive responses such as

foot withdrawal and Moro reflex; summary measures of alertness, cuddliness, activity level, and reinforcement value of the infant's behavior; and patterns of irritability and soothability in response to specific items.

4. Ratings were then made of the infant's response to a potentially stressful stimulus. For this procedure, a metal disc was chilled in ice water for three minutes, then placed against the neonate's left thigh and held there for a period of five seconds. The procedure was repeated five times, and after each presentation behavioral responsivity, irritability, and soothability were rated.

5. Finally, ratings were made of episodic irritability and resistance to soothing throughout the course of the assessment sequence, but especially before a feed. A standard series of soothing procedures was applied and the level of intervention needed to soothe the neonate after each episode of irritability was rated.

The behaviors were rated on five-point scales, with a higher score indicating a higher level of the attribute measured. The scores were combined into four composite scales: IRRITABILITY, RESISTANCE TO SOOTHING, REACTIVITY, and REINFORCEMENT VALUE. In addition, two measures of ACTIVITY were included: one during sleep, and one while awake. Interrater reliabilities, as determined by intraclass correlations, ranged from $\underline{r} = 0.79$ to $\underline{r} = 0.99$.

RESULTS

The mean scores and standard deviations for the temperament variables are presented in Table 1. Separate *t* tests were performed on each of the behavioral scores for the full-term and preterm infants. The results indicated that, for both the full-term and the preterm groups, there were no significant differences between AGA and SGA infants in any of the behavioral areas.

To determine if behavioral differences might exist based on sex of the infants, *t* tests were next computed separately for same-sex male and same-sex female twins, again separating the full-term and preterm AGA and SGA infants. These results also failed to demonstrate significant differences in neonatal behavior between AGA and SGA infants.

Finally, a stepwise discriminant analysis was performed to determine if the neonatal temperament profile might be different for the AGA and SGA infants. The results indicated that none of the neonatal behavioral variables discriminated between AGA and SGA infants in either the full-term or preterm groups.

Table 1

Means and Standard Deviations for Temperament Variables for Full-term and Preterm AGA and SGA Infants

Variables	AGA		SGA	
Full-term	Mean	SD	Mean	SD
Irritability	2.55	.73	2.30	.90
Resistance to Soothing	3.06	.90	3.06	1.01
Activity Awake	3.40	.93	3.07	1.07
Activity Asleep	3.10	1.01	2.93	1.09
Reactivity	2.98	.79	3.06	.57
Reinforcement Value	2.88	.92	3.11	.85

	AGA		SGA	
Preterm	Mean	SD	Mean	SD
Irritability	2.09	.87	2.15	.75
Resistance to Soothing	2.93	1.21	3.36	.85
Activity Awake	3.53	1.19	3.60	.91
Activity Asleep	3.47	1.06	3.47	.74
Reactivity	3.12	.91	3.27	.62
Reinforcement Value	3.31	.85	2.84	.79

CONCLUSIONS

These results have demonstrated that being small for gestational age does not place the infant at risk for deviance in behaviors related to temperament during the neonatal period. The findings were observed within both full-term and preterm groups of infants, and within male and female groups. Since the infant plays a significant role in its interaction with its caregivers, the caregiver's response to the infant's initial temperament will not be compromised by factors related to size for gestational age. In addition, inappropriate labeling of the infant as having a "behavioral disorder" at this stage of development can be avoided. Future research can determine if temperament differences are readily observed between AGA and SGA infants later in development.